

Application No. 09/918,855

Docket No. 22-0097

Amendments to the Claims

1 (Cancelled).

2 (Currently Amended): The method of claim 1, further comprising: 3, wherein the assigning step comprises:

assigning said first communications data stream to a first terminal located near an edge of the beam spot; and

assigning said second communications data stream to a second terminal located near a center of the beam spot.

3 (Currently Amended): A method for providing communications data, in a satellite communications network, between user terminals and a ground station via a satellite, comprising:

generating at least one carrier signal in a spot beam covering user terminals, said carrier signal conveying communications data over at least one downlink to the user terminals;

modulating a single carrier signal simultaneously with first and second independent communications data streams over first and second modulation channels, respectively, of a multi-dimensional modulator; and

The method of claim 1, further comprising:

assigning said first and second communications data streams to first and second terminals, respectively, based on a signal strength of downlinks to said terminals.

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4 (Currently Amended): A method for providing communications data, in a satellite communications network, between user terminals and a ground station via a satellite, comprising:

generating at least one carrier signal in a spot beam covering user terminals, said carrier signal conveying communications data over at least one downlink to the user terminals;

modulating a single carrier signal simultaneously with first and second independent communications data streams over first and second modulation channels, respectively, of a multi-dimensional modulator; and

The method of claim 1, further comprising:

before modulation, encoding said first and second communications data streams based upon different encoder rates.

5 (Currently Amended): A method for providing communications data, in a satellite communications network, between user terminals and a ground station via a satellite, comprising:

generating at least one carrier signal in a spot beam covering user terminals, said carrier signal conveying communications data over at least one downlink to the user terminals;

modulating a single carrier signal simultaneously with first and second independent communications data streams over first and second modulation channels, respectively, of a multi-dimensional modulator; and

The method of claim 1, further comprising:

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modulating simultaneously the first and second communications data streams over the I and Q channels, respectively, of a QPSK modulator.

6 (Original): A method for providing communications data, in a satellite communications network, between user terminals and a ground station via a satellite, comprising:

generating at least one carrier signal in a spot beam covering user terminals, said carrier signal conveying communications data over at least one downlink to the user terminals; and

modulating a single carrier signal simultaneously with first and second independent communications data streams over first and second modulation channels, respectively, of a multi-dimensional modulator comprising:

modulating the first communications data stream over first and second modulation channels of a QAM modulator; and

simultaneously modulating the second communications data stream over a third modulator channel of the QAM modulator.

7 (Currently Amended): The method of claim 6, [[1,]] further comprising:

simultaneously establishing first and second communications links with first and second user terminals, respectively, through said first and second modulation channels.

8 (Currently Amended): The method of claim 6, [[1,]] further comprising:

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limiting an entire communications link with a first terminal to one channel of said multi-dimensional modulator.

9 (Cancelled).

10 (Currently Amended): A method for providing communications data, in a satellite communications network, between user terminals and a ground station via a satellite, comprising:

generating at least one carrier signal in a spot beam covering user terminals, said carrier signal conveying communications data over at least one downlink to the user terminals;

modulating a single carrier signal simultaneously with first and second independent communications data streams over first and second modulation channels, respectively, of a multi-dimensional modulator;

~~The method of claim 1, further comprising:~~

attempting to establish a communications link between the satellite and a user terminal over the first modulation channel of the multi-dimensional modulator;

determining that the first modulation channel is not carrying data directed to the user terminal; and

switching to another modulation channel of the multi-dimensional modulator, after the determining step and again attempting to establish a communications link.

11 (Cancelled).

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12 (Original): A satellite system comprising:

multiple terminals;

a satellite generating a beam, said beam defining a coverage area of said beam, said satellite using a common carrier signal to transmit data to multiple terminals located in said beam; and

a ground station including a multi-dimensional modulator having at least two input channels receiving first and second separate data streams associated with independent communications links with first and second terminals, respectively, the modulator assigning the first and second data streams to first and second dimensions, respectively, of a multi-dimensional modulator;

said modulator assigning said first communications data stream to a first terminal located near an edge of said coverage area of said beam; and

said modulator assigning said second communications data stream to a second terminal located near a center of the coverage area of the beam;

13-14 (Cancelled).

15 (Original): A satellite system comprising:

multiple terminals;

a satellite generating a beam, said beam defining a coverage area of said beam, said satellite using a common carrier signal to transmit data to multiple terminals located in said beam; and

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a ground station including a multi-dimensional modulator having at least two input channels receiving first and second separate data streams associated with independent communications links with first and second terminals, respectively, the modulator assigning the first and second data streams to first and second dimensions, respectively, of a multi-dimensional modulator,

said modulator simultaneously modulating said first and second communications data streams over I and Q modulation channels, respectively, of a QPSK modulator.

16 (Currently Amended): A satellite system comprising:

multiple terminals;

a satellite generating a beam, said beam defining a coverage area of said beam,
said satellite using a common carrier signal to transmit data to multiple terminals located
in said beam;

a ground station including a multi-dimensional modulator having at least two
input channels receiving first and second separate data streams associated with
independent communications links with first and second terminals, respectively, the
modulator assigning the first and second data streams to first and second dimensions,
respectively, of a multi-dimensional modulator;

The system of claim 11, further comprising:

a QAM modulator having first and second modulation channels receiving said first communications data stream and having a third modulation channel receiving said second communications data stream, said QAM modulator simultaneously modulating

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said first and second communications data streams over corresponding modulation channels.

17 (Currently Amended): The system of claim 16, [[11,]] further comprising:

first and second user terminals simultaneously establishing first and second communications links, respectively, with said ground station through said first and second modulation channels.

18 (Currently Amended): The system of claim 16, [[11,]] wherein said modulator limits an entire communications link with a first terminal to one channel of said multi-dimensional modulator.

19 (Currently Amended): The system of claim 16, [[11,]] wherein said modulator limits an entire communications link with a first terminal to fewer than all channels of said multi-dimensional modulator.

20 (Original): A satellite system comprising:

multiple terminals;

a satellite generating a beam, said beam defining a coverage area of said beam, said satellite using a common carrier signal to transmit data to multiple terminals located in said beam; and

a ground station including a multi-dimensional modulator having at least two input channels receiving first and second separate data streams associated with

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independent communications links with first and second terminals, respectively, the modulator assigning the first and second data streams to first and second dimensions, respectively, of a multi-dimensional modulator;

at least one of said multiple terminals comprising:

a processor, at a terminal, attempting to establish a communications link between said terminal and satellite over a first modulation channel defined by the multi-dimensional modulator, said processor determining that the first modulation channel is not carrying data directed to said terminal; and

a switch controlled by the processor to switch to another modulation channel after determining that the first modulation channel was incorrect.

21 (Cancelled).

22 (Currently Amended): A communication data signal embodied in a carrier wave of a downlink from a communications satellite, comprising:

first and second independent communications data streams modulated, simultaneously and in parallel, onto respective first and second modulation channels defined in accordance with a multi-dimensional modulation technique, said first and second communications data streams carrying independent and unrelated data; and

~~The communications data stream of claim 21, further comprising encoded communications data in at least one of said first and second communications data streams.~~

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23 (Currently Amended): The communications data signal of claim 22, [[21,]] wherein said first and second independent communications data streams are modulated onto the I and Q channels, respectively, of a QPSK modulation technique.

24 (Currently Amended): The communications data signal of claim 22, [[21,]] further comprising:

first, second and third independent communications data streams directed to first, second and third user terminals, modulated onto first, second and third modulation channels of a 16-QAM modulation technique.